



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/550,077 | 05/30/2008 | Tao Zhang | 000644/0002 | 1561 |

26610 7590 12/22/2010
STROOCK & STROOCK & LAVAN LLP
180 MAIDEN LANE
NEW YORK, NY 10038

| |
|----------|
| EXAMINER |
|----------|

SAHU, MEENAKSHI S

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2881

| | |
|-----------|---------------|
| MAIL DATE | DELIVERY MODE |
|-----------|---------------|

12/22/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/550,077 | ZHANG, TAO | |
| | Examiner | Art Unit | |
| | MEENAKSHI S. SAHU | 2881 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/19/05, 9/11/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Receipt is acknowledged of preliminary amendments to the claims and specifications filed 9/19/2005.
2. Claims 1, 2, 4 to 37 and 40 to 43 are amended. No new claims have been added.

Information Disclosure Statement

3. Receipt is acknowledged of information disclosure statements (IDS) submitted on 9/19/2005 and 9/11/2006. The submission is in compliance with the provisions of 37 CFR 1.97. A signed copy of the information disclosure statement is here enclosed.

Priority

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d) for GB 0413357.5, which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2881

6. Claims 1, 9, 16-30, 32-37, are rejected under 35 U.S.C. 102(b) as being anticipated by Ando et al. (EP 0840355 A1; supplied by the applicant with the IDS of 9/19/2005).

Claims 1, 16 and 35:

Ando discloses a charged particle beam system [ion source = element 10 in Fig 10, or element 54 in Fig 2, col 1 lines 24 to 34]including a main chamber [or processing chamber = element 30 in Fig 1, col 6 lines 16 to 24] an exchange chamber [or spare chamber = element 62 in Fig 1; col 6 lines 16 to 20] and a substrate handling device [or holder = element 32 and the ball screws = element 40 in Fig 1, 2; col 6 lines 34 to 37 and col 7 lines 15 to 31] and mounted inside the main chamber [Fig 1] for loading and unloading a substrate [= element 2 in Fig 2] into and out of the main chamber, the device comprising a bar having a longitudinal axis [= element 40 in Fig 2] and a side member [= element 32 in Fig 2] extending laterally from the bar for supporting the substrate to one side of the bar [Fig 2], and the bar mounted for movement along the longitudinal axis between, at least a first position, in which the side member is located within the exchange chamber and a second position, in which the side member is located outside the exchange chamber [Fig 1; the holder moving mechanism performs the operation of a linear movement of the holders from within the processing chamber = main chamber, so that they traverse the processing position and the movement of between the processing chamber to the vacuum chamber =exchange chamber. This is equivalent to a movement of the side member along the longitudinal axis between the exchange chamber and in the processing chamber, which is outside the exchange chamber]

Claim 9: Ando discloses a means for supporting the bar [= elements 42 and 52 in Fig 1; col 7 lines 15 to 31].

Art Unit: 2881

Claim 11: Ando discloses the bar has a transverse axis [this is assumed to mean a vertical axis – the bar is rotatable around a central axis indicating it has a transverse axis, Fig 2] and a means for translating the bar along the transverse axis [“translate” is interpreted as move from one place to another; and the means for moving the bar along the transverse axis is done through rotation [Fig 2, col 7 line 15 to 30] .

Claim 12: Ando discloses means for translating the bar in the transverse direction [see claim 11 above] however the bar is attached to a means or an arm [element 36 in Fig 2], which when the bar is rotated results in the substrate holder [element 32 in Fig 2] being raised or lowered.

Claim 13: Ando discloses the side member is in the form of a cantilevered wing [Fig 2]

Claim 14: Ando discloses the device is mounted on the inner wall [Fig 1].

Claim 15: Ando discloses the main chamber has an aperture [= element 64 in Fig 1] and the bar which is connected to the side member [=element 32 in Fig 1] projects through [Fig 3].

Claim 18, 19 and 30, 32, 33, 34: Ando discloses a cassette having at least one shelf [Fig 6] the shelf having a ledge around it [the supporting pins = element 70 provide the ledge around a space], the side member movable through space when the side member is lowered or raised so as to permit the substrate to be deposited or picked up from the shelf [the periphery of each holder or side member = element 32, has 4 notches = element 33 through which the supporting pins = element 70 pass through].

Art Unit: 2881

Claims 17 and 31: Ando discloses a cassette having a plurality of shelves [Fig 6]

Claims 20 to 29 : Ando discloses the substrate is a workpiece, wafer or wafer chip [the term “semiconductor substrate or liquid crystal display substrate” in col 1 lines 24 to 27 encompasses a wafer, workpiece wafer chip or substrate with several layers of different types]

Claims 36 and 37: Ando discloses means for evacuating the main chamber [col 6 lines 21 to 25] and a means for controlling the environment within the main chamber [the environment is controlled by changing the pressure in the main chamber which in turn is done using the vaccum pump which is not shown in Fig 1].

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2881

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-8, 38-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ando et al. in view of Kishi (JP 58040759 A; supplied by the applicant with the IDS of 9/19/2005).

Claims 2, 3, 8, 38, 39, 40 to 43:

Ando disclose all the limitations of claims 2, 3, 38, 39, 40 and 43 but fail to explicitly disclose a means for translating the bar, the translating means includes a rail protruding from the bar and that the rail runs along the bar.

In analogous art of moving a sample cassette between a sample chamber and a reserve chamber, Kishi teaches using a telescope-type arm (translating means) to send a cassette between a processing or sample chamber and a reserve chamber which includes a rail protruding from the bar. The Figure from Kishi et al. is reproduced below and the bar is indicated by B while the rail is indicated by the letter R and the cassette by the letter L.

Given the teachings of Kishi, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to use Ando's invention and modify it by utilizing a translating means including a rail protruding from a bar. This would simplify the apparatus configuration and facilitate the movement of the substrate from the processing chamber to the transfer chamber using a transferring means that occupies a small volume. Generally transfer arms or robots occupy a fairly large

Ando disclose all the limitations of claims 4 to 7 but fail to explicitly

Art Unit: 2881

disclose the bar includes a set of linear bearings for holding the rail, the bar is cogged to provide a rack, the means for translating the bar includes a pinion arranged to engage the rack, the pinion is directly coupled to a motor

In analogous art of moving a sample cassette between a sample chamber and a reserve chamber, Kishi teaches using a telescope-type arm (translating means) to send a cassette between a processing or sample chamber and a reserve chamber which includes a rail protruding from the bar. The Figure from Kishi et al. is reproduced below and the linear bearing is indicated by LB and the bar is cogged is indicated by the letter C, the pinion is shown by the letter P.

Given the teachings of Kishi. it would have been obvious to one of ordinary skill in the art at the time the invention was made, to use Ando's invention and modify it by utilizing a translating means including a linear bearing, pinion and a cogged rail. Adding a motor to the pinion would be obvious since these are routinely done to move mechanical structures and Ando et al. in fact disclose a motor to control the transfer arm [Fig 1].

The linear bearing, pinion and cogged rail are routinely used in mechanical structures and would simplify the apparatus configuration and facilitate the movement of the substrate from the processing chamber to the transfer chamber using a transferring means that occupies a small volume.

The motivation to combine the teachings of Kishi with the invention of Ando would be to achieve a smaller volume and simple structure for the transfer means which in turn would result in less volume to be evacuated to vacuum.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MEENAKSHI S. SAHU whose telephone number is (571)270-3101. The examiner can normally be reached on Monday - Friday 8AM - 5PM est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MEENAKSHI S SAHU /
Examiner, Art Unit 2881